REMARKS

Claims 1, 2 and 7-26 are pending in the application. Claims 3-6 are cancelled. Claims 15-26 are newly added.

The Office Action objects to the drawings and states that the length of optical waveguide and the length of optical fiber must be shown in the same embodiment. Applicants respectfully disagree, because the length of optical fiber and the length of optical waveguide are claimed in the alternative. Nonetheless, Applicants submit that this rejection is moot, because claim 1 is amended to include only the embodiment having a length of optical waveguide, and independent claim 15 is newly added to separately disclose the embodiment having a length of optical fiber as was previously provided in claim 1.

Claim 1 is objected to as being indefinite. Claim 1 is amended to obviate this objection.

Claims 1, 2 and 9-14 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 6,275,317 to Doerr et al., hereinafter "Doerr". Applicants respectfully traverse this rejection.

Independent claims 1 and 15 now separately disclose embodiments previously disclosed together in the alternative in claim 1. Therefore, the above rejection is addressed in the context of both claim 1 and claim 15.

Independent claim 1 provides a mounting arrangement for at least one optical component in a planar lightwave circuit. The arrangement includes a substrate, an input optical fiber associated with the substrate, and an output optical waveguide in a given set of planar layers of the substrate, where the at least one optical component is mountable on the substrate to transmit optical radiation from the input optical fiber to the output optical waveguide. The arrangement further includes a length of optical

waveguide on the substrate in the same planar layers of the output optical waveguide. The length of optical waveguide is interposed between the input optical fiber and the at least one optical component so that the at least one optical component is interposed between the length of optical waveguide and the output optical waveguide.

Doerr discloses a hybrid integrated optical transmitter 100, as shown in Figures 1 and 2 (col. 4, line 64). Transmitter 100 includes a laser array 105, an optical combiner 110 and an optical amplifier/modulator 115 supported on and affixed to a platform 120 (col. 4, lines 64-67). Optical combiner 110 is fabricated with six input waveguides W_1-W_6, combines the wavelengths from each of waveguides W_1-W_6, and provides a single output W_O (col. 6, lines 20-26). A lensed fiber 125 may be used to couple radiation from amplifier/modulator 115 (col. 5, lines 4-5). Lensed fiber 125 is positioned and aligned using ferrules 130 and 135 (col. 5, lines 5-8). An optical isolator 140 is interposed between optical combiner 110 and optical amplifier/modulator 115 (col. 5, lines 17-18).

The Office Action, on page 7, section 9, reasserts that Doerr teaches "a length of optical waveguide" as being the slab waveguide 110 interposed between the input fiber and at least one optical component. Applicants respectfully disagree, and reiterate that combiner 110 of Doerr, including waveguides W_1-W_6, represents a single integrated input waveguide. Thus, Doerr does not disclose a length of optical waveguide separate from an input optical fiber, as provided in claim 1.

Doerr discloses that radiation towards the ball lens 155 is produced by an optical combiner 110 associated with a laser array 105 and including six input waveguides W_1 - W_6 (col. 6, lines 21-41). Despite the possibly confusing graphical representation of Figure 1 of Doerr, the input waveguides W_1 - W_6 do in fact represent combiner 110. In support of this contention, Doerr specifically states that "[o]ptical combiner 110 **fabricated with** the six (6) input waveguides, W_1 - W_6, combines the different wavelengths from each corresponding laser within array 105 into a single output, W_{out}." (col. 6, lines 23-27). Thus, combiner 110 is "fabricated with" waveguides W_1 - W_6, and therefore combiner 110 represents a single input waveguide that incorporates

waveguides W_1 - W_6. Combiner 110 and waveguides W_1 - W_6 represent a single input component.

The Office Action asserts that combiner 110 is a slab waveguide interposed between the input fiber and the optical components. Doerr also refutes this contention. Doerr, at col. 27, specifically states that "optical combiner 110 utilizes a slab waveguide region . . ." Thus, the slab waveguide described by examiner is merely a **region** of combiner 110, and thus cannot be a distinct waveguide.

Thus, Doerr fails to disclose both an input arrangement and a length of optical waveguide. Even assuming that waveguide combiner 110 is analogous to the optical waveguide of claim 1, Doerr would still fail to disclose a separate input optical fiber, because combiner 110 of Doerr is directly fed via the lasers L_1 - L_6.

Doerr does not disclose a length of optical waveguide distinct from combiner 110, and interposed between combiner 110 and at least one optical component. Therefore, because Doerr does not disclose "a length of optical waveguide on said substrate in the same planar layers of said output optical waveguide, said length of optical waveguide being interposed between said input optical fiber and said at least one optical component," as recited in claim 1, Doerr does not disclose or suggest the elements of claim 1. Thus, claim 1 is not anticipated by Doerr.

Independent claim 15 provides a mounting arrangement for at least one optical component in a planar lightwave circuit. The arrangement includes a substrate, an input optical fiber associated with the substrate, and an output optical waveguide in a given set of planar layers of the substrate, where the at least one optical component is mountable on the substrate to transmit optical radiation from the input optical fiber to the output optical waveguide. The arrangement further includes a length of optical fiber associated to the substrate between the at least one optical component and the output optical waveguide so that the at least one optical component is interposed between the input optical fiber and the length of optical fiber.

The Office Action refutes Applicants' contention that Doerr does not disclose an additional length of fiber that is distinct from fiber 125. The Office Action, on page 7, section 9, states that Doerr discloses two ferrules 130 and 135, and that ferrules are well known tools to couple two lengths of optical fibers. Although the Office Action admits that Figure 1 only discloses a continuous bar to represent optical fiber 125, the Office Action further states that one of ordinary skill in the art would not use "expensive ferrules" to connect one continuous fiber.

Applicants respectfully disagree with the Office Action's contention, and submit that Doerr specifically contradicts the Office Action's assumption that those skilled in the art would only use ferrules for coupling optical fibers. Doerr, in col. 5, line 5, states that "[l]ensed fiber 125 is **positioned and aligned** to optical amplifier/modulator 115 using properly dimensioned **ferrules** 130 and 135, or using, for example, UV cured epoxy." Thus, Doerr discloses that the purpose of ferrules 130 and 135 is to position and align fiber 125, and thus Doerr provides a reason to use ferrules other than for coupling optical fibers. Doerr does not disclose or imply the use of ferrules for coupling optical fibers, and thus Doerr does not disclose or imply that fiber 125 could be separate fibers.

Doerr's suggestion of cured epoxy as an alternative to ferrules 130 and 135 reinforces Applicants' submission that Doerr does not contemplate the use of ferrules 130 and 135 for coupling optical fibers, as epoxy is not generally considered a preferable means for coupling optical fibers. Thus, Doerr provides no suggestion or implication that fiber 125 could be provided as distinct fiber lengths, and therefore, Doerr does not disclose a length of optical fiber as recited in claim 15.

Therefore, Doerr does not disclose "a length of optical fiber associated to said substrate between said at least one optical component and said output optical waveguide so that said at least one optical component is interposed between said input optical fiber and said length of optical fiber" as recited in claim 15.

Claims 2 and 9-14 depend from claim 1. For at least the reasoning provided in support of claim 1, claims 2 and 9-14 are also not anticipated by Doerr.

For the reasons set forth above, it is submitted that the rejection of claims 1, 2 and 9-14 under 35 U.S.C. 102(b) as anticipated by Doerr is overcome. Applicants respectfully request that the rejection of claims 1, 2 and 9-14 be withdrawn.

Claims 3-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Doerr in view of U.S. Patent No. 6,081,635 to Hehmann, hereinafter "Hehmann". Applicants respectfully traverse this rejection.

Claims 3 and 4 are cancelled. Newly added claims 17 and 18 depend from newly added independent claim 15 and recite subject matter previously recited in claims 3 and 4.

As provided in the discussion of claim 15, Doerr does not disclose "a length of optical fiber associated to said substrate between said at least one optical component and said output optical waveguide," as recited in claim 15.

Hehmann discloses an optical isolator constructed on a support provided with a recess (col. 2, lines 43-46). Two wedge-shaped plates and a Faraday rotator are inserted in the recess (col. 2, lines 55-57). Optical fibers are inserted into v-shaped grooves on each side of the optical isolator, and two spherical lenses are positioned directly in front of the ends of the two optical fibers (col. 3, lines 20-26).

Hehmann discloses an optical isolator having optical fibers on each side of the isolator, but does not disclose a length of optical fiber positioned between either of the optical fibers and one or more optical components. Therefore, Hehmann does not disclose "a length of optical fiber associated to said substrate between said at least one optical component and said output optical waveguide," as recited in claim 15.

Therefore, Doerr and Hehmann, whether considered independently or in combination with one another, fail to disclose or suggest the elements of claim 15. Thus, claim 15 is patentable over the cited combination of Doerr and Hehmann.

Claims 17 and 18 depend from claim 15. For at least reasoning similar to that provided in support of claim 15, claims 17 and 18 are patentable over the cited combination of Doerr and Hehmann.

Claim 5 is rejected under 103(a) as being unpatentable over Doerr in view of U.S. Patent No. 5,999,303 to Drake, hereinafter "Drake". Applicants respectfully traverse this rejection.

Claim 5 is cancelled. Newly added claim 19 depends from newly added independent claim 15 and recites subject matter previously recited in claim 5.

As provided in the discussion of claim 15, Doerr does not disclose "a length of optical fiber associated to said substrate between said at least one optical component and said output optical waveguide," as recited in claim 15.

Drake discloses an optical head utilizing a micro-machined element combined with a light source and a lens to write and read data onto a storage disk. Light is transmitted from an optical fiber to the optical head and is affected by the micro-machined element such as a steerable micro-machined mirror (col. 3, lines 3-6).

Drake discloses optical components assembled on a substrate, but does not disclose a length of optical fiber positioned between one or more optical components and an output optical waveguide. Therefore, Drake does not disclose "a length of optical fiber associated to said substrate between said at least one optical component and said output optical waveguide", as recited in claim 15. Thus, Drake does not disclose or suggest the elements of claim 15.

Therefore, Doerr and Drake, whether considered independently or in combination with one another, fail to disclose or suggest the elements of claim 15. Thus, claim 15 is patentable over the cited combination of Doerr and Drake.

Claim 19 depends from claim 15. For at least reasoning similar to that provided in support of claim 15, claim 19 is patentable over the cited combination of Doerr and Drake.

Claim 6 is rejected under 103(a) as being unpatentable over Doerr. Applicants respectfully traverse this rejection.

Claim 6 is cancelled. Newly added claim 20 depends from newly added independent claim 15 and recites subject matter previously recited in claim 6.

As provided in the discussion of claim 15, Doerr does not disclose or suggest the elements of claim 15. Therefore, claim 15 is patentable over Doerr. Claim 20 depends from claim 15. For at least reasoning similar to that provided in support of claim 15, claim 20 is patentable over Doerr.

Claims 7 and 8 are rejected under 103(a) as being unpatentable over Doerr in view of U.S. Patent No. 5,611,006 to Tabuchi, hereinafter "Tabuchi". Applicants respectfully traverse this rejection.

Claims 7 and 8 depend from claim 1. As provided in the discussion of claim 1, Doerr does not disclose "a length of optical waveguide . . . being interposed between said input optical fiber and said at least one optical component", as recited in claim 1.

Tabuchi discloses an integrated optical device having optical components assembled on a substrate (col. 7, lines 3-5). In one embodiment, a cube type half mirror, a spherical lens and an optical fiber are disposed on the substrate (col. 7, lines 14-16).

Tabuchi discloses optical components assembled on a substrate, but does not disclose a length of optical waveguide positioned between an input optical fiber and one or more optical components. Tabuchi also does not disclose a length of optical fiber positioned between one or more optical components and an output optical fiber. Therefore, Tabuchi does not disclose "a length of optical waveguide . . . being interposed between said input optical fiber and said at least one optical component" as recited in claim 1. Thus, Tabuchi does not disclose or suggest the elements of claim 1.

Therefore, Doerr and Tabuchi, whether considered independently or in combination with one another, fail to disclose or suggest the elements of claim 1. Thus, claim 1 is patentable over the cited combination of Doerr and Tabuchi.

Claims 7 and 8 depend from claim 1. Thus claim 1, and claims 7 and 8 for at least the reasoning provided in support of claim 1, are all patentable over the cited combination of Doerr and Tabuchi.

For the reasons set forth above, it is submitted that the rejection of claims 7 and 8 under 35 U.S.C. 103(a) as being unpatentable over Doerr in view of Tabuchi is overcome. Applicants respectfully request that the rejection of claims 7 and 8 be withdrawn.

An indication of the allowability of all pending claims by issuance of a Notice of Allowability is earnestly solicited.

Respectfully submitted,

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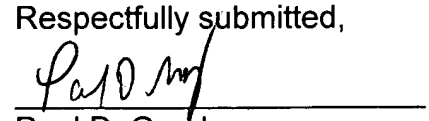

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